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TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No. **9101.00004**

In Re Application Of: **Rein et al.**

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
10/691,954	**10/23/2003**	**Gimie, Mahmoud**	**10534**	**3747**	**6298**

Invention: **PISTON HAVING A PATTERNED COATING AND METHOD OF APPLYING SAME**

COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on **July 29, 2005**

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Signature

Dated: **September 28, 2005**

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I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on

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cc:

P30LARGE/REV06

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Art Unit:	3747	
Examiner:	Gimie, Mahmoud	
Applicant(s):	Rein, et al.	
Serial No.:	10/691,954	**APPEAL BRIEF**
Filing Date:	October 23, 2003	
For:	PISTON HAVING A PATTERNED COATING AND METHOD OF APPLYING SAME	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

By Notice of Appeal filed on July 29, 2005, applicants have appealed the final rejection of claims 1 and 10 - 17 communicated in the Office Action dated March 29, 2005 as supplemented by the Advisory Action dated August 12, 2005. Applicants submit this brief in support of that appeal.

REAL PARTY IN INTEREST

The real party in interest is MAHLE Technology, Inc., a corporation having a place of business at 23030 Haggerty Road, Farmington Hills, Michigan 48335, as evidenced by the Assignment of the Inventors, Wolfgang Rein, David Roth, and Jonathan Douglas, recorded on October 23, 2003 at Reel 014633 and Frame 0374 in the United States Patent and Trademark Office.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences regarding the present application.

STATUS OF THE CLAIMS

Claims 1 - 19 were originally pending in this application. Claims 1 and 10 - 17 have been finally rejected. Claims 2 - 9 have been objected to as being dependent upon a rejected base claim. Claims 18 - 19 have been cancelled.

The rejection of claims 1 and 10 -17 is being appealed. A clean copy of claims 1 - 17 is attached hereto at Appendix A.

STATUS OF AMENDMENTS

Claims 1 - 19 were originally pending in this application. Claims 1 and 10 - 19 were rejected and claims 2 - 9 were objected to as being dependent upon a rejected base claim in the December 14, 2004 Office Action. Claims 1, 12, and 16 were amended on March 11, 2005 in response to the December 14, 2004 Office Action.

Claims 1 and 10 - 19 were finally rejected on March 29, 2005. On June 27, 2005, applicants filed an Amendment After Final pursuant to 37 CFR § 1.116 in an effort to resolve all outstanding issues and, failing this, to place the claims in a better condition for appeal. Claims 1, 2, 4, 6, 8, 12, and 16 were amended after the final rejection. Claims 18 - 19 were cancelled. The Amendment After Final was entered as indicated in the Advisory Action dated August 12, 2005.

Thus, claims 1 - 17 remain pending in this application. Claims 1 and 10 - 17 have been finally rejected. Claims 2 - 9 stand objected to as being dependent upon a rejected base claim (claim 1).

SUMMARY OF INVENTION

The present invention, as defined in independent claims 1, 12, and 16 is directed toward a piston which is adapted for reciprocal movement within a cylinder of an internal combustion engine. The piston includes a body defining a longitudinal axis of the piston extending in the direction of reciprocal movement. The body also has a crown formed at the uppermost margins of the body and a skirt depending from the crown and adapted for relative sliding motion with respect to the cylinder. The skirt includes an outer circumference having a major thrust side and a minor thrust side formed substantially opposite each other on the outer circumference of the skirt. A coating is bonded to the skirt so as to be juxtaposed between the skirt and the cylinder. The coating has a plurality of recesses formed thereon so as to define a predetermined pattern of recesses on the surface of the skirt. The plurality of recesses include a series of lubrication grooves extending across the outer circumference of the piston skirt at a predetermined angle relative to the longitudinal axis. As described in independent claim 1, the grooves collectively define a chevron formation that act to operatively engage the lubricant between the skirt and the cylinder wall. As described in claim 12, the grooves define a substantially hatch-like pattern. In addition, and as described in claim 16, the recesses define a series of lubrication retaining disks disposed in uniform spaced relation with respect to each other to provide lubrication retention along the outer circumference of the piston skirt.

ISSUES

35 U.S.C. § 102

The single issue in this appeal is whether the invention described in claims 1, 10, 12 -14, 16, and 17 is anticipated by and therefore unpatentable under 35 U.S.C. § 102 over U.S. Patent No. 4,987,865 issued to Schenkel.

GROUPING OF THE CLAIMS

Claims 1, 12, and 16 are in independent form. Claims 2 - 11 are ultimately dependent upon independent claim 1 and thus stand or fall with this claim. However, the Examiner has indicated that claims 2 - 9 are merely objected to as being dependent upon a rejected base claim. Further, claim 11 was finally rejected as being obvious and therefore unpatentable under 35 U.S.C. § 103 over the Schenkel '865 patent. Claim 11 adds further perfecting limitations to the invention described in independent claim 1. Thus, if claim 1 is patentable over the Schenkel reference, so is clam 11.

Claims 13 - 15 are ultimately dependent upon independent claim 12 and thus stand or fall with this claim. However, claim 15 was finally rejected as being obvious and therefore unpatentable under 35 U.S.C. § 103 over the Schenkel '865 patent. Claim 15 adds further perfecting limitations to the invention described in independent claim 12. Thus, if claim 12 is patentable over the Schenkel reference, so is claim 15.

Claim 17 is ultimately dependent upon independent claim 16 and thus stands or falls with this claim.

In summary, the grouping of the claims in this appeal is as follows:

Claim 1 is in independent form. Claims 2 - 11 stand or fall with this claim.

Claim 12 is in independent form. Claims 13 - 15 stand or fall with this claim.

Claim 17 is in independent form. Claim 16 stands or falls with this claim.

ARGUMENT

In the final rejection dated March 29, 2005, the Examination stated:

> Claims 1, 10, 12 - 14, 16 and 17 are rejected under 35 U.S.C. § 102(b) as being anticipated by Schenkel (4,987,865).
>
> Schenkel discloses a piston (10) adapted for reciprocal movement within a cylinder of an internal combustion engine, said piston comprising: a body having a crown (12) formed at the upper most margins of said body and a skirt (14) depending from said crown and adapted for relative sliding motion with respect to the cylinder, said skirt including an outer circumference having a major thrust side and a minor thrust side formed substantially opposite each other on said outer circumference of said skirt (14); a coating (28) bonded to said skirt so as to be juxtaposed between said skirt (14) and the cylinder, said coating (28) having a plurality of recesses (26) formed thereon so as to define a predetermined pattern of recesses (saw tooth pattern, col. 2 and ll. 43) on the surface of said skirt, said plurality of recesses (26) including a series of lubrication grooves extending across said outer circumference of said piston skirt at a predetermined angle in a chevron formation (V formation), operatively engaging lubricant between said skirt and the cylinder wall.
>
> With regard to claim 12, the coating is a polymer coating, col. 3 and ll. 7
>
> With regard to claims 12 and 13, the ridges and valleys are substantially hatched-like and the major and minor thrust sides are inherently and necessarily present in the invention.
>
> With regard to claim 14, see above.
> With regard to claim 16 and 17, for the property of lubrication retention, see col. 3 and ll. 26 - 43, while the thrust sides are inherently and necessarily present in the invention.

A claims is said to be anticipated where each and every limitation of the claim can be found in a single prior art reference. Independent claims 1, 12, and 16 describe patterns defined by the plurality of recesses ***formed on the coating bonded*** to the skirt of the piston. These patterns are neither disclosed nor suggested by the Schenkel '865 reference. Furthermore, Schenkel teaches the use of ridges and valleys ***formed on the skirt***, not the coating. Moreover, the recesses of the present invention include a series of lubrication grooves extending across the outer circumference of the piston skirt ***at a predetermined angle relative to the longitudinal axis***. These features are simply not disclosed or suggested in the Schenkel '865 patent. Accordingly, applicants respectfully submit that each and every limitation of the independent claims in this case cannot be found in the Schenkel '865 patent, nor any other patent of record in this case. The remaining claims are all ultimately dependent upon a respective one of the independent claims and add further perfecting limitations. Accordingly, applicants respectfully request that the rejections of claims 1, 10, 12 - 14, 16, and 17 are improper and should be reversed. In addition, applicants also request that the rejections of claims 11 and 15 under § 103 be reversed on the basis that these claims depend from an allowable base claim.

A. The Prior Art

1. The Schenkel '865 Patent

The Schenkel '865 patent is directed toward a piston assembly 10 including an integral aluminum head 12 and skirt 14. The skirt 14 has an outer surface for engaging a cylinder wall. The outer surface of the skirt 14 includes a plurality of pointed ridges 24. Each of the pointed ridges is separated by a valley 26. The pointed ridges 24 extend annularly about the outer surface of the skirt 14 and are for engaging the cylinder. Thus, the ridges and valleys ***are formed in the skirt***. The ridges 24 and valleys 26 are then coated with a fluorocarbon polymer.

However, the Schenkel '865 patent neither discloses nor suggests a coating having a plurality of recesses ***formed in the coating***. In addition, this patent neither discloses nor suggests that the plurality of recesses include a series of intersecting grooves extending across the outer circumference of the piston skirt ***at a predetermined angle relative to the longitudinal axis of the piston***. Finally, the Schenkel '865 patent neither discloses nor suggests that the plurality of recesses collectively define a chevron formation, as required in independent claim 1; a substantially hatch-like pattern as required in independent claim 12; nor a series of lubrication retaining discs disposed in uniformed spaced relation with respect to each other as required in independent claim 16.

B. The Piston of the Present Invention

In contrast to the Schenkel patent, the present invention is directed toward a piston which is adapted for reciprocal movement within a cylinder of an internal combustion engine. The piston includes a body defining a longitudinal axis of the piston extending in the direction of reciprocal movement. The body also has a crown formed at the upper most margins of the body and a skirt depending from the crown and adapted for relative sliding motion with respect to the cylinder. The skirt includes an outer circumference having a major thrust side and a minor thrust side formed substantially opposite each other on the outer circumference of the skirt. A coating is bonded to the skirt so as to be juxtaposed between the skirt and the cylinder. The ***coating has a plurality of recesses*** formed thereon so as to define a predetermined pattern of recesses on the surface of the skirt. The plurality of recesses include a series of lubrication grooves extending across the outer circumference of the piston skirt ***at a predetermined angle relative to the longitudinal axis***. As described in claim 1, the grooves collectively define a chevron formation that act to operatively engage the lubricant between the skirt and the cylinder wall. As described

in claim 12, the grooves define a substantially hatch-like pattern. In addition and as described in claim 16, the recess define a series of lubrication retaining discs disposed in uniform spaced relation with respect to each other.

Thus, each of the groove patterns described in claims 1, 12, and 16 are ***formed in the coating*** bonded to the skirt of the piston and extend at a predetermined angle relative to the longitudinal axis of the piston.

C. Discussion

Applicants respectfully submit that the piston skirt having predetermined patterns of recesses in the form of grooves or retaining discs ***formed in the coating*** described in each of claims 1, 12, and 16 is not disclosed or suggested by the Schenkel '865 patent. Indeed, Schenkel merely teaches V-shaped annular grooves ***formed about the circumference of the piston skirt***. The skirt is then coated with a polymer ***after*** the grooves are formed on the surface of the skirt. The grooves taught by Schenkel also do not extend at any predetermined angle and do not form any specific pattern except that they are annularly disposed about the skirt. In this context, Schenkel is merely representative of the state of the art which was expressly distinguished in paragraph [0006] of the description of the related art found in the specification of the present application.

In summary, the Schenkel '865 patent neither discloses nor suggests a plurality of recesses formed in the coating so as to define a predetermined pattern of recesses on the surface of the skirt. Similarly, Schenkel does not disclose or suggest that the recesses include a series of lubrication grooves extending across the outer circumference of the piston skirt at a predetermined angle. Finally, the Schenkel '865 patent neither discloses nor suggests that the plurality of recesses collectively define a chevron formation, as required in independent claim 1;

a substantially hatch-like pattern as required in independent claim 12; nor a series of lubrication retaining discs disposed in uniformed spaced relation with respect to each other as required in independent claim 16.

Moreover, there is simply no motivation provided in the Schenkel '865 reference to provide a piston having a skirt to which is bonded coating where the ***coating*** has a plurality of recesses so as to define a predetermined pattern on the surface of the skirt and where the recesses further define a series of lubrication grooves extending across the outer circumference of the piston skirt at a predetermined angle relative to the longitudinal axis of the piston so as to define predetermined formations in the coating thereon, nor that the plurality of recesses define a series of lubrication retaining discs in uniform spaced relation with respect to each other.

None of these features are disclosed or suggested in the Schenkel '865 patent. Thus, the Schenkel '865 patent is not a proper anticipatory reference under § 102 and does not bar the patentability of the claims presently pending in this appeal. For all the reasons set forth above, applicants respectfully request that the Examiner's rejection of the claims pending in this case be reversed.

CONCLUSION

In view of the above, it is respectfully submitted that independent claims 1, 12, and 16 recite structure that is not disclosed or suggested by the prior art and that is patentably distinguishable from the subject matter of the references of record in this case. Dependent claims 2 - 11, 13 - 15, 17, and 19 are each ultimately dependent upon one of these independent claims and add further perfecting limitations. As such, the prior art references do not suggest the subject invention. However, even if they did, they could only be applied through hindsight after restructuring the disclosure of the prior art in view of applicants' invention. A rearrangement of

the pistons described in these references to derive applicants' invention would, in and of itself, be an invention.

In conclusion, applicants respectfully submit that the claims presently pending in this appeal clearly distinguish over the prior art and are therefore allowable. Accordingly, applicants respectfully solicit the allowance of the claims pending in this case.

Respectfully submitted,

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Attorney Docket No.: 9101.00004

APPENDIX A

1. A piston adapted for reciprocal movement within a cylinder of an internal combustion engine, said piston comprising:

a body defining a longitudinal axis of said piston extending in the direction of reciprocal movement and having a crown formed at the uppermost margins of said body and a skirt depending from said crown and adapted for relative sliding motion with respect to the cylinder, said skirt including an outer circumference having a major thrust side and a minor thrust side formed substantially opposite each other on said outer circumference of said skirt;

a coating bonded to said skirt so as to be juxtaposed between said skirt and the cylinder, said coating having a plurality of recesses formed thereon so as to define a predetermined pattern of recesses on the surface of said skirt, said plurality of recesses including a series of lubrication grooves extending across said outer circumference of said piston skirt at a predetermined angle relative to said longitudinal axis such that said series of grooves collectively define a chevron formation that act to operatively engage lubricant between said skirt and the cylinder wall.

2. A piston as set forth in claim 1, wherein said plurality of recesses include a series of lubrication flow directing grooves extending in a downwardly converging manner at a predetermined angle relative to said longitudinal axis and across said outer circumference of said piston skirt in a chevron formation.

3. A piston as set forth in claim 2, wherein said plurality of recesses further include a reservoir channel located substantially at the center of said minor thrust side of said piston skirt and extending in a direction substantially parallel to the direction of reciprocal motion of said

piston within the cylinder, said chevron formation of grooves terminating at said reservoir channel.

4. A piston as set forth in claim 1, wherein said plurality of recesses include a series of flow directing lubrication grooves extending in a downwardly diverging manner at a predetermined angle relative to said longitudinal axis and across said outer circumference of said piston skirt in a chevron formation.

5. A piston as set forth in claim 4, wherein said plurality of recesses further include a reservoir channel located substantially at the center of said major thrust side of said piston skirt and extending in a direction substantially parallel to the direction of reciprocal motion of said piston within the cylinder, said chevron formation of grooves terminating at said reservoir channel.

6. A piston as set forth in claim 1, wherein said plurality of recesses include a series of lubrication flow directing grooves extending in a downwardly converging manner at a predetermined angle relative to said longitudinal axis and across said minor thrust side in a chevron formation.

7. A piston as set forth in claim 6, wherein said plurality of recesses further include a reservoir channel located substantially at the center of said minor thrust side and extending in a direction substantially parallel to the direction of reciprocal motion of said piston within the cylinder, said chevron formation of grooves terminating at said reservoir channel.

8. A piston as set forth in claim 1, wherein said plurality of recesses include a series of lubrication flow directing grooves extending in a downwardly diverging manner at a predetermined angle relative to said longitudinal axis and across said major thrust side in a chevron formation.

9. A piston as set forth in claim 8, wherein said plurality of recesses further include a reservoir channel located substantially at the center of said major thrust side and extending in a direction substantially parallel to the direction of reciprocal motion of said piston within the cylinder, said chevron formation of grooves terminating at said reservoir channel.

10. A piston as set forth in claim 1, wherein said coating is a polymer coating.

11. A piston as set forth in claim 1, wherein said coating is a metallic coating.

12. A piston adapted for reciprocal movement within a cylinder of an internal combustion engine, said piston comprising:

a body defining a longitudinal axis of said piston extending in the direction of reciprocal movement and having a crown formed at the uppermost margins of said body and a skirt depending from said crown and adapted for relative sliding motion with respect to the cylinder, said skirt including an outer circumference having a major thrust side and a minor thrust side formed substantially opposite each other on said outer circumference of said skirt;

a coating bonded to said skirt so as to be juxtaposed between said skirt and the cylinder, said coating having a plurality of recesses formed thereon so as to define a predetermined pattern of recesses on the surface of said skirt, said plurality of recesses including a series of intersecting grooves extending across the outer circumference of said piston skirt at a predetermined angle relative to said longitudinal axis so as to define a substantially hatch-like pattern, operatively engaging lubricant between said skirt and the cylinder wall.

13. A piston as set forth in claim 12, wherein said coating is bonded to said major thrust side and said minor thrust side of said piston skirt and adapted to operatively engage lubricant between said major thrust side and the cylinder wall and said minor thrust side and the cylinder wall.

14. A piston as set forth in claim 12, wherein said coating is a polymer coating.

15. A piston as set forth in claim 12, wherein said coating is a metallic coating.

16. A piston adapted for reciprocal movement within a cylinder of an internal combustion engine, said piston comprising:

a body having a crown formed at the uppermost margins of said body and a skirt depending from said crown and adapted for relative sliding motion with respect to the cylinder, said skirt including a substantially smooth outer circumference having a major thrust side and a minor thrust side formed substantially opposite each other on said outer circumference of said skirt;

a coating bonded to said skirt so as to be juxtaposed between said skirt and the cylinder, said coating having a plurality of recesses formed thereon so as to define a predetermined pattern of recesses on the surface of said skirt, said plurality of recesses defining a series of lubrication retaining discs in uniform spaced relation with respect to each other to provide lubrication retention along said outer circumference of said piston skirt.

17. A piston as set forth in claim 16, wherein said coating is bonded to said major thrust side and said minor thrust sides of said piston skirt relation and adapted to operatively engage lubricant between said major thrust side and the cylinder wall and said minor thrust side and the cylinder wall.